REMARKS

Claims 1-9 are currently pending in the present application. Claims 1 and 7 have been amended. Claim 5 has been cancelled. Claims 8 and 9 have been added. Support for the newly added claims 8 and 9 is found at formulae (2) to (4) at page 3 of the published application.

Applicants have carefully studied the outstanding Office Action. The present Response is intended to be fully responsive to all points of rejection raised by the Examiner and is believed to place the application in condition for allowance. Favorable reconsideration and allowance of this application is respectfully requested. Applicants respectfully request reconsideration and withdrawal of the Examiner's rejections in view of the foregoing amendments and following remarks.

Claim Objections

Claim 5 has been cancelled and its features have been incorporated into claims 1 and 7, with the correct spelling, as suggested by Examiner.

Claim Rejections – 35 USC § 112

Examiner has rejected claim 1 under 35 USC 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Examiner states that "[t]he claimed range of hydroxyl number does not have any units."

Response

The standard for definiteness is whether a claim reasonably apprises those of skill in the art of its scope. *In re Warmerdam*, 33 F.3d 1354, 1361, 31 U.S.P.Q.2d 1754, 1759 (Fed. Cir. 1994). It is respectfully submitted that one skilled in the art would recognize that a hydroxyl

number is a term that reflects the number of hydroxyl groups in a molecule, used in polymer analysis to determine the extent of reaction or number of hydroxyl groups available for further reaction. In rejecting a claim under the second paragraph of 35 U.S.C. § 112, it is incumbent upon the Examiner to establish that one of ordinary skill in the pertinent art, when reading the claims in light of the supporting specification, would not have been able to ascertain with a reasonable degree of precision and clarity the particular area set out and circumscribed by the claims. *Ex Parte Wu*, 10 USPQ2d 2031, 2033 (B.P.A.I. 1989); *In re Hammack*, 427 F.2d 1378, 166 USPQ 204 (C.C.P.A. 1970). Applicants respectfully request Examiner to provide reasons why claim 1 would not be readily be understood by those of ordinary skill in the art or withdraw his rejection of claim 1 under 35 USC 112.

Claim Rejections -35 USC § 102

Claims 1-7 have been rejected under 35 USC 102(b) as being anticipated by Hayakawa et al (WO96/34064) (hereinafter "Hayakawa et al.") Examiner states:

> Hayakawa et al discloses a thermoset paint composition comprising (a) a fluorine containing copolymer of fluoro-olefin, hydroxyl group containing vinyl based monomer and other vinyl based monomer having a hydroxy group value between 60 and 150 mgKOH/g [column 2 lines 34-39], (b) a vinyl based (co)polymer comprising a monomer represented by the general formula 1:
>
> wherein n = 0-10 and the (co)polymer has a hydroxy group value between 60 and 150 mgKOH/g [column 2 lines 40-46; 55-60], and (d) a blocked polyisocyanate compounds [column 2 lines 49-50]. The hydroxyl group containing vinyl based monomer of component (a) may be lactone modified 2-hydroxyalkyl (meth)acrylate, e.g. ε-caprolactone modified 2-hydroxyethyl (meth)acrylate [column 4 lines 3-10]. The other vinyl based monomer of component (a) may be 2-hydroxyethyl (meth)acrylate [column 4 line 40] and monomers with a cyclic backbone such as cycloalkyl ester of (meth)acrylic acid [column 4 line 34], styrene [column 4 line 41], cyclyohexyl vinyl ether [column 4 line 44], and combinations of two or more [column 4 line 46]. The monomer of component (b) represented by formula 1 is also a lactone modified vinyl based monomer such as modified 2-hydroxyalkyl (meth)acrylate, e.g. ε-caprolactone modified 2-hydroxyethyl (meth)acrylate [column 5 lines 54-63]. Since n = 0-10 in formula 1, there are between 0 and 10 caprolactone repetitive units in the lactone modified hydroxyalkyl (meth)acrylate. Other vinyl based monomers in component (b)

include 2-hydroxyethyl (meth)acrylate [column 6 line 7] and monomer with a cyclic backbone including cycloalkyl ester of (meth)acrylic acid [column 6 line 1], styrene [column 6 line 7], and combinations of two or more [column 6 line 10-12]. Components (a) and (b) each read on both the claimed (meth)acrylic resin (A) of claim 1 and the lactone polyol (C) of claim 5.

Regarding claim 3, the disclosure of caprolactone modified 2-hydroxyethyl (meth)acrylate is considered the explicit disclosure of caprolactone modified 2-hydroethyl methacrylate and caprolactone modified 2-hydroxyethyl acrylate.

Regarding claim 4, example polymers AC-2 and AC-3 have cyclohexyl methacrylate in the monomer mixture in an amount of 10 weight percent and 5 weight percent, respectively [Table 2].

Regarding claim 6, all examples of lactone modified (meth)acrylic resins AC-1 through AC-5 have acid value below 30 mgKOH/g [Table 2].

Claims 1-4 and 7 have been rejected under 35 USC 102(b) as being anticipated by Sawada et al (US 2003/0171473 A1) (hereinafter "Sawada et al."). Examiner states:

Sawada et al disclose a cationic electro-deposition coating composition comprising an amino containing acrylic resin (B) and a blocked polyisocyanate curing agent (C) [0019]. An example of the amino containing acrylic resin (B) is Preparation Example 8 which is formed from a monomer mixture including FA-1 which is a polycaprolactone-modified hydroxyethyl acrylate with about one caprolactone repetitive unit per monomer (calculated from molecular weight of 230) [Table 2; footnote 5], 2-hydroxyethyl acrylate [Table 2] and 6.6 percent by weight of styrene (a cyclic backbone monomer) [Table 2]. Preparation Example 8 has a hydroxyl value of 144.5 mgKOH/g. The coatings are useful as anticorrosive primer on a steel plate [0072].

Claims 1-3, 6 and 7 have been rejected under 35 USC 102(b) as being anticipated by Shibatoh et al (JP 9-169950 A) (hereinafter "Shibatoh et al.") Examiner states:

Shibatoh et al disclose a thermosetting paint composition comprising (A) a compound with has at least 2 isocyanate reactive groups and (B) a blocked isocyanate with at least 2 isocyanate groups [column 2 lines 17-22]. Component (A) is preferably an acrylic resin contain hydroxyl groups [column 3 lines 15-22] and contain monomers including 2-hydroxyethyl (meth)acrylate [column 3 lines 24-25], lactone modified vinyl monomers such as 1-10 mol of lactone such as caprolactone (1-10 repetitive units of caprolactone) added to 1 mol of hydroxyalkyl ester such as 2-hydroxyethyl (meth)acrylate [column 3 lines 55-61], and combinations thereof [column 3 lines 62-63]. The inventive example of component A-2 has a hydroxyl value of 140 mgKOH/g, an acid value of 12

> mgKOH/g and uses PLAXEL FM-2 which has two repetitive units of caprolactone for each hydroxyethyl methacrylate [Table 2]. The coating compositions are useful as paints for metal, plastic or wooden surfaces [column 8 lines 52-57].
>
> Regarding claim 3, the disclosure of caprolactone modified 2-hydroxyethyl (meth)acrylate is considered the explicit disclosure of caprolactone modified 2-hydroethyl methacrylate and caprolactone modified 2-hydroxyethyl acrylate.

Claims 1-3, 6 and 7 have been rejected under 35 USC 102(b) as being anticipated by Moriya et al (JP 7-207223 A) (hereinafter "Moriya et al.") Examiner states:

> Moriya et al disclose thermoset coating compositions comprising (A) a vinyl based copolymer with hydroxy group value between 60-200 mgKOH/g and (B) a blocked polyisocyanate compound [column 2 lines 24-32]. The component (A) includes a 2-hydroxyethyl (meth)acrylate [column 3 line 18] modified by caprolactone [column 3 line 20] in an amount of 1-5 mol of lactone to 1 mol of (meth)acrylate (1-5 repetitive caprolactone units) [column 3 lines 24-27]. Example A-3 discloses a vinyl copolymer (A) with monomers PURAKUSERU FM-2 (caprolactone modified 2-hydroxyethyl methacrylate) and 2-hydroxyethyl methacrylate, hydroxyl group value of 140 mgKOH/g and acid value of 30 mgKOH/g [Table 2].

Response

The novel feature of the invention is that a coating composition comprises a (meth) acrylic resin (A) having a hydroxyl group, which is obtained by copolymerizing a mixture having for its essential components a polycaprolactone-modified hydroxyalkyl (meth) acrylate and a different hydroxyl-group containing (meth) acrylate, a polyisocyanate compound (B) having a plurality of isocyanate groups, and a lactone polyol (C) having three or more hydroxyl groups. The hydroxyl group of the hydroxyl group-containing (meth)acrylate is a primary hydroxyl group, and the hydroxyl number of the (meth) acrylic resin (A) is 125 to 145.

Accordingly, the claimed coating composition may improve the stain resistance of a coated film and demonstrate satisfactorily coating performance including appearance of the coated film.

A prior art reference anticipates the claimed invention under 35 U.S.C. § 102 only if every element of a claimed invention is identically shown in that single reference, arranged as they are in the claims. *In re Bond*, 910 F.2d 831, 832, 15 U.S.P.Q.2d 1566, 1567 (Fed. Cir. 1990). It is respectfully asserted that neither Hayakawa et al., Sawada et al., Shibatoh et al. nor Moriya et al. teach or disclose each and every element of the claims under 35 U.S.C. § 102. Applicants respectfully request that Examiner reconsider the aforementioned rejections in light of the amendments to the claims and the following remarks.

Hayakawa et al. disclose thermoset paint compositions including fluorine containing copolymer, vinyl based copolymer, alkyl etherified melanine resin, and polyisocyanate compound. However, Hayakawa et al. fail to disclose the claimed feature of amended claim 1 in which a lactone polyol (C) has three or more hydroxyl groups. All limitations of the claimed invention must be considered when determining patentability. *In re Lowry*, 32 F.3d 1579, 1582, 32 U.S.P.Q.2d 1031, 1034 (Fed. Cir. 1994). Applicants, therefore, respectfully request that Examiner withdraw the rejection of claims 1-7 in view of Hayakawa et al.

Sawada et al. disclose a cationic electrodeposition coating composition including an epoxy resin containing amino groups, an acrylic resin containing amino groups, and a blocked polyisocyanate curing agent. However, Sawada et al. fail to teach or disclose the claimed feature in which a lactone polyol (C) has three or more hydroxyl groups. All limitations of the claimed invention must be considered when determining patentability. *In re Lowry*, 32 F.3d 1579, 1582, 32 U.S.P.Q.2d 1031, 1034 (Fed. Cir. 1994). Further, as the Examiner failed to support his rejection of claim 2-4, with an explanation or specific citation to any reference, Applicants respectfully request that Examiner withdraw the rejection of claims 1-4 and 7 in view of Sawada et al.

Shibatoh et al. disclose a thermosetting paint composition including a compound having per molecule at least 2 functional groups, a blocked isocyanate, an ultraviolet absorber, an organotin compound, and an amino resin. However, Shibatoh et al. fail to disclose and teach the claimed feature in which a lactone polyol (C) has three or more hydroxyl groups. All limitations of the claimed invention must be considered when determining patentability. *In re Lowry*, 32 F.3d 1579, 1582, 32 U.S.P.Q.2d 1031, 1034 (Fed. Cir. 1994). Applicants, therefore, respectfully request that Examiner withdraw the rejection of claims 1-3, 6 and 7 in view of Shibatoh el at.

Moriya et al. disclose thermoset covering compositions including a vinyl copolymer, a blocked polyisocyanate compound, and an alkyl etherified amino resin. However, Moriya et al. fail to disclose and teach the claimed feature in which a lactone polyol (C) has three or more hydroxyl groups. All limitations of the claimed invention must be considered when determining patentability. *In re Lowry*, 32 F.3d 1579, 1582, 32 U.S.P.Q.2d 1031, 1034 (Fed. Cir. 1994). Applicants, therefore, respectfully request that Examiner withdraw the rejection of claims 1-3, 6 and 7 in view of Moriya el at.

Claim Rejections -35 USC § 103

Examiner has rejected claims 1-3 and 7 under 35 USC 103(a) as being unpatentable over Marutani (JP 06-220397). In the office action, the Examiner states:

> Marutani discloses urethane coating composition comprising an acrylic resin having hydroxyl number of 140-280 and a isocyanate prepolymer [0006]. The acrylic resin is based on monomers such as 2-hydroxyethyl (meth)acrylate, 3-hydroxypropyl (meth)acrylate, and others [0008] modified with 1-6 mol (1-6 repeating units) of ε-caprolactone [0009]. The isocyanate prepolymer is preferably a diisocyanate like hexahydro diisocyanate, xylene diisocyanate and isophorone diisocyanate [0020].
>
> Marutani does not specifically disclose the acrylic resin containing two different hydroxyl group containing (meth)acrylate monomers, but it does disclose a list of suitable hydroxy group containing (meth)acrylate monomers, discussed above. It is *prima facie* obvious to combine two composition each of which is taught by the prior art to be useful for the same purpose, in order to form a third

composition to be used for the very same purpose. See *In re Kerkhoven*, 626 F.2d 846, 850, 205 USPQ 1069, 1072 (CCPA). Therefore, one skilled in the art would have found it obvious to use a mixture of the disclose acrylate monomers, since the reference itself recognizes them as functional equivalents in the art.

Marutani discloses a hydroxyl value range of 140-280 which overlaps the claimed range of 125-145. In the case where the claimed ranges overlap or lie inside ranges disclosed by the prior a *prima facie* case of obviousness exists *In re Wertheim*, 541 F. 2d 257, 1911 USPQ 0- (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990).

Response

Marutani (JP 06-220397) discloses a two-pack type urethane coating composition including an acrylic resin, an oligoester, and an isocyanate prepolymer. However, Marutani fails to teach, disclose, or suggest the claimed feature in which a lactone polyol (C) has three or more hydroxyl groups. All limitations of the claimed invention must be considered when determining patentability. *In re Lowry*, 32 F.3d 1579, 1582, 32 U.S.P.Q.2d 1031, 1034 (Fed. Cir. 1994). It should be noted that the mere fact that the prior art could be readily modified to arrive at the claimed invention does not render the claimed invention obvious. The prior art must suggest the desirability of such a modification. Applicants, therefore, respectfully request that Examiner withdraw the rejection of claims 1-3 and 7 in view of Moriya el at.

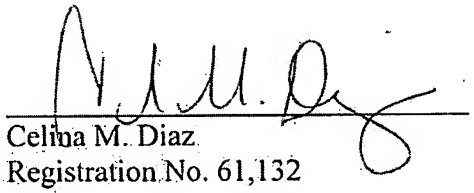
Finally, it is respectfully asserted that even if the cited references could be easily combined, the claimed invention could not have been easily achieved. In view of the foregoing amendments and remarks, it is respectfully submitted that the present application is in condition for allowance and such action is respectfully requested.

CONCLUSION

It is respectfully urged that the subject application is patentable over the references cited by Examiner and is now in condition for allowance. Applicants request consideration of the application and allowance of the claims. If there are any outstanding issues that the Examiner feels may be resolved by way of a telephone conference, the Examiner is cordially invited to contact Colin P. Cahoon or Celina M. Diaz at 972-367-2001.

The Commissioner is hereby authorized to charge any additional payments that may be due for additional claims to Deposit Account 50-0392.

Respectfully submitted,



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